Date of Issue:
24 April 2015

SAFETY DATA SHEET

1. SUBSTANCE AND SOURCE IDENTIFICATION

Product Identifier

RM Number: 8541
RM Name: USGS24 Graphite (Carbon Isotopes in Graphite)
Other Means of Identification: Not applicable.

Recommended Use of This Material and Restrictions of Use

This Reference Material (RM) is intended to provide a sample with a known isotope-amount ratio of carbon (C). The equivalent name for this RM, as used by the International Atomic Energy Agency (IAEA) and the U.S. Geological Survey (USGS), is USGS24. A unit of RM 8541 consists of one bottle containing approximately 0.8 g of graphite.

Company Information

National Institute of Standards and Technology
Standard Reference Materials Program
100 Bureau Drive, Stop 2300
Gaithersburg, Maryland 20899-2300

Telephone: 301-975-2200
FAX: 301-948-3730
E-mail: SRMMSDS@nist.gov
Website: http://www.nist.gov/srm

Emergency Telephone ChemTrec:
1-800-424-9300 (North America)
+1-703-527-3887 (International)

2. HAZARDS IDENTIFICATION

Classification

Physical Hazard: Not classified.
Health Hazard: Not classified.

Label Elements

Symbol: Not applicable.

Signal Word: Not applicable.

Hazard Statement(s): Not applicable.

Precautionary Statement(s): Not applicable.

Hazards Not Otherwise Classified: Not applicable.

Ingredients(s) with Unknown Acute Toxicity: Not applicable.

3. COMPOSITION AND INFORMATION ON HAZARDOUS INGREDIENTS

Substance: Graphite

Other Designations: black lead; mineral carbon; natural graphite crayon noir.

Components are listed in compliance with OSHA's 29 CFR 1910.1200; for the actual values see the NIST Report of Investigation.

Hazardous Component(s)	CAS Number	EC Number (EINECS)	Nominal Mass Concentration (%)
Carbon	7782-42-5	231-955-3	100

4. First Aid Measures

Description of First Aid Measures:

Inhalation: If adverse effects occur, remove to uncontaminated area. If not breathing, give artificial respiration or oxygen by qualified personnel. Seek immediate medical attention.

Skin Contact: Wash skin with soap and water for at least 15 minutes. If necessary, seek medical attention.

Eye Contact: Flush eyes with water for at least 15 minutes. If necessary, seek medical attention.

Ingestion: If a large amount is swallowed, get medical attention.

Most Important Symptoms/Effects, Acute and Delayed: Coughing, respiratory effects (pulmonary inflammation).

Indication of any immediate medical attention and special treatment needed, if necessary: If any of the above symptoms are present or suspected, seek medical attention if needed.

5. Fire Fighting Measures

Fire and Explosion Hazards: Slight fire hazard. Dust may form explosive mixtures with air. See Section 9, "Physical and Chemical Properties" for flammability properties.

Extinguishing Media:
Suitable: Regular dry chemical; carbon dioxide; water; regular foam.
Unsuitable: High-volume water streams.

Specific Hazards Arising from the Chemical: None listed.

Special Protective Equipment and Precautions for Fire-Fighters: Avoid inhalation of material or combustion byproducts. Wear full protective clothing and NIOSH approved self-contained breathing apparatus (SCBA).

NFPA Ratings (0 = Minimal; 1 = Slight; 2 = Moderate; 3 = Serious; 4 = Severe)

Health = 1 Fire = 1 Reactivity = 0

6. Accidental Release Measures

Personal Precautions, Protective Equipment and Emergency Procedures: Any accumulated material on surfaces should be removed and properly disposed of. Keep unnecessary personnel away. Use suitable protective equipment; see Section 8, "Exposure Controls and Personal Protection".

Methods and Materials for Containment and Clean up: Notify safety personnel of spills. Collect spilled material in appropriate container for disposal. Isolate hazard area and deny entry. Prevent discharge to natural waters, sewers and biological waste water treatment plants.

7. Handling and Storage

Safe Handling Precautions: Minimize dust generation and accumulation on surfaces. Routine housekeeping should be instituted to ensure that dust does not accumulate on surfaces. Avoid generating dust. See Section 8, "Exposure Controls and Personal Protection".

Storage: Store and handle in accordance with all current regulations and standards. Keep separated from incompatible substances (see Section 10, "Stability and Reactivity").

8. Exposure Controls and Personal Protection

Exposure Limits for Graphite

OSHA (PEL)

TWA: 15 mppcf (natural)
TWA: 15 mg/m^3 (synthetic, total dust)
TWA: 5 mg/m^3 (synthetic, respirable fraction)

ACGIH (TLV)

TWA: 2 mg/m^3 (all forms, except graphite fibers, respirable fraction)

NIOSH (REL)

TWA: 2.5 mg/m^3 (natural, respirable dust)
IDLH: 1250 mg/m^3

Engineering Controls: Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Personal Protection: In accordance with OSHA 29 CFR 1910.132, subpart I, wear appropriate Personal Protective Equipment (PPE) to minimize exposure to this material.

Respiratory Protection: At a minimum wear a National Institute for Occupational Safety and Health (NIOSH) certified air-purifying tight-fitting full-face respirator with N-100 cartridge or equivalent in accordance with respiratory protection requirements specified in OSHA 29 CFR 1910.134 and NIOSH 42 CFR 84 whenever exposure to the product by inhalation is possible.

Eye/Face Protection: Wear chemical goggles or safety glasses at all times unless the NIOSH full-face respirator discussed immediately above is being worn. The respirator's mask provides appropriate eye. An eyewash station should be readily available near areas of use.

Skin and Body Protection: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

9. PHYSICAL AND CHEMICAL PROPERTIES

Descriptive Properties:

Appearance (physical state, color, etc.)	gray to black, oily, powder
Molecular Formula	C
Molar Mass (g/mol)	12
Odor	odorless
Odor threshold	not available
pH	not available
Evaporation rate	not available
Melting point/freezing point (ºC)	sublimation at 3650 °C (6602 °F)
Density	2.09 g/cc to 2.23 g/cc
Vapor Pressure (mmHg)	not available
Vapor Density (air = 1)	not available
Viscosity (cP)	not available
Solubility(ies)	insoluble in water, acid and alkali.
Partition coefficient (n-octanol/water)	not available
Particle Size	not available

Thermal Stability Properties:

Autoignition Temperature (ºC)	not applicable
Thermal Decomposition (ºC)	not applicable
Initial boiling point and boiling range (ºC)	not applicable
Explosive Limits, LEL (Volume %)	not available
Explosive Limits, UEL (Volume %)	not available
Flash Point (ºC)	not applicable
Flammability (solid, gas)	not available

10. STABILITY AND REACTIVITY

Reactivity: Stable at normal temperatures and pressure.

Stability: X Stable _____ Unstable

Possible Hazardous Reactions: No data available.

Conditions to Avoid: Avoid generating dust. Avoid heat, flames, sparks and other sources of ignition. Keep out of water supplies and sewers.

Incompatible Materials: Halogens, oxidizing materials, metals, and bases.

Fire/Explosion Information: See Section 5, "Fire Fighting Measures".

Hazardous Decomposition: Oxides of carbon.

Hazardous Polymerization: _____ Will Occur X Will Not Occur

11. TOXICOLOGICAL INFORMATION

Route of Exposure: X Inhalation X Skin _____ Ingestion

Symptoms Related to the Physical, Chemical and Toxicological Characteristics: Coughing, respiratory effects (pulmonary inflammation).

Potential Health Effects (Acute, Chronic and Delayed):

Inhalation: Dust may cause mild, mechanical irritation. Long-term exposure to graphite dusts may cause pneumoconiosis.

Skin Contact: Dust may cause mechanical irritation.

Eye Contact: No toxicity data available; dust may cause mechanical irritation.

Ingestion: No information available.

Numerical Measures of Toxicity:

Acute Toxicity: Not classified; no data available.

Skin Corrosion/Irritation: Not classified; no data available.

Serious Eye Damage/Eye Irritation: Not classified; no data available.

Respiratory Sensitization: Not classified; no data available.

Skin Sensitization: Not classified; no data available.

Germ Cell Mutagenicity: Not classified; no data available.

Carcinogenicity: Category 2

Listed as a Carcinogen/Potential Carcinogen _____ Yes X No

Carbon is not listed by NTP, IARC or OSHA as a carcinogen/potential carcinogen.

Reproductive Toxicity: Not classified; no data available.

Specific Target Organ Toxicity, Single Exposure: Not classified; no data available.

Specific Target Organ Toxicity, Repeated Exposure: Not classified; no data available.

Aspiration Hazard: Not applicable.

12. ECOLOGICAL INFORMATION

Ecotoxicity Data: No data available.

Persistence and Degradability: No biodegradation expected.

Bioaccumulative Potential: No data available.

Mobility in Soil: No data available.

Other Adverse effects: No data available.

13. DISPOSAL CONSIDERATIONS

Waste Disposal: Dispose of waste in accordance with all applicable federal, state, and local regulations. Prevent discharge to natural waters, sewers and biological waste water treatment plants.

14. TRANSPORTATION INFORMATION

U.S. DOT and IATA: Not regulated by DOT or IATA.

15. REGULATORY INFORMATION

U.S. Regulations:

CERCLA Sections 102a/103 (40 CFR 302.4): Not regulated.

SARA Title III Section 302 (40 CFR 355.30): Not regulated.

SARA Title III Section 304 (40 CFR 355.40): Not regulated.

SARA Title III Section 313 (40 CFR 372.65): Not regulated.

OSHA Process Safety (29 CFR 1910.119): Not regulated.

SARA Title III Sections 311/312 Hazardous Categories (40 CFR 370.21):

ACUTE HEALTH:	No.
CHRONIC HEALTH:	No.
FIRE:	No.
REACTIVE:	No.
PRESSURE:	No.

State Regulations:
California Proposition 65: Not listed

U.S. TSCA Inventory: Graphite is listed.

TSCA 12(b), Export Notification: Not listed.

Canadian Regulations: WHMIS Information is not provided for this material.

16. OTHER INFORMATION

Issue Date: 24 April 2015

Sources: ChemADVISOR, Inc., SDS *Graphite*, 15 December 2014.

Key of Acronyms:

ACGIH	American Conference of Governmental Industrial Hygienists	NOEC	No Observed Effect Concentration
ALI	Annual Limit on Intake	NRC	Nuclear Regulatory Commission
CAS	Chemical Abstracts Service	NTP	National Toxicology Program
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act	OSHA	Occupational Safety and Health Administration
CFR	Code of Federal Regulations	PEL	Permissible Exposure Limit
DOT	Department of Transportation	PNOR	Particulates Not Otherwise Regulated
EC50	Effective Concentration, 50 %	RCRA	Resource Conservation and Recovery Act
EC10	Effective Concentration, 10 %	REL	Recommended Exposure Limit
EINECS	European Inventory of Existing Commercial Chemical Substances	RM	Reference Material
EPCRA	Emergency Planning and Community Right-to-Know Act	RQ	Reportable Quantity
IARC	International Agency for Research on Cancer	RTECS	Registry of Toxic Effects of Chemical Substances
IATA	International Air Transportation Agency	SARA	Superfund Amendments and Reauthorization Act
IDLH	Immediately Dangerous to Life and Health	SCBA	Self-Contained Breathing Apparatus
LC50	Lethal Concentration, 50 %	SRM	Standard Reference Material
LD50	Lethal Dose, 50 %	STEL	Short Term Exposure Limit
LEL	Lower Explosive Limit	TLV	Threshold Limit Value
MSDS	Material Safety Data Sheet	TPQ	Threshold Planning Quantity
LOAEC	Lowest Observable Adverse Effect Concentration	TSCA	Toxic Substances Control Act
NFPA	National Fire Protection Association	TWA	Time Weighted Average
NIOSH	National Institute for Occupational Safety and Health	UEL	Upper Explosive Limit
NIST	National Institute of Standards and Technology	WHMIS	Workplace Hazardous Materials Information System

Disclaimer: Physical and chemical data contained in this SDS are provided only for use in assessing the hazardous nature of the material. The SDS was prepared carefully, using current references; however, NIST does not verify the data in the SDS. The certified values for this material are given in the NIST Report of Investigation.

Users of this RM should ensure that the SDS in their possession is current. This can be accomplished by contacting the SRM Program: telephone (301) 975-2200; fax (301) 948-3730; e-mail srmmsds@nist.gov; or via the Internet at http://www.nist.gov/srm.